BY ORDER OF THE
COMMANDER 341ST SPACE WING

MALMSTROM AFB INSTRUCTION 15-101

2 SEPTEMBER 1998

Weather

WEATHER SUPPORT PROCEDURES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements Air Force Policy Directive (AFPD) 15-1, *Atmosphere and Space Environmental Support;* Air Force Instruction (AFI) 15-118, *Requesting Specialized Weather Support*; AFI 15-114, *Weather Support Evaluation*; Air Force Manual (AFMAN) 15-111, *Surface Aviation Observations METAR Code*; AFMAN 15-124, *Meteorological Codes*; and AFMAN 15-125, *Weather Station Operations*; and establishes responsibilities and weather support procedures. It provides general information for weather services, including: weather observations and forecasts; weather warnings, watches, and advisories; dissemination of information; and reciprocal support. It applies to units assigned to the 341st Space Wing and subordinate units, and units assigned to, or supported by, Malmstrom Air Force Base.

SUMMARY OF REVISIONS

This revision includes changes in weather observations, advisories, watches, warnings, and notification. Office symbols and nomenclature have also been updated. A (x) indicates significant revisions from the previous edition.

Chapter 1

GENERAL INFORMATION

1.1. General. The Base Weather Station (BWS), 341st Operations Support Squadron, Weather Flight (341 OSS/OSW), provides weather support to the 341st Space Wing (341 SW) and its units assigned to Malmstrom AFB. The BWS also supports National Guard units at Great Falls and Helena, Montana, as specified in annually reviewed letters of agreement. This instruction establishes weather support requirements and procedures outlined by Air Force and Air Force Space Command directives and has been coordinated at the local level to meet mission needs.

1.2. Concept of Operations:

1.2.1. The BWS will provide weather information to all supported base agencies for the purposes of operational and planning decisions and for the protection of government resources. The BWS tailors this information, when possible, to the specific needs of supported agencies. Forecasting services are provided 24 hours a day, 7 days a week, for military (or military related) operational use only.

NOTE: If manning drops to unacceptable levels, the BWS will reduce hours of operations.

1.2.2. Since there is usually only one forecaster on duty at the BWS, the list of duty priorities defined below will be followed. The duty forecaster will use good judgment in complying with these priorities, especially where there is imminent danger to life and property.

1.2.2.1. Respond to Emergency War Orders or Conventional Wartime Tasks.

1.2.2.2. Respond to Aircraft and Ground Emergency Tasks.

1.2.2.3. Answer Pilot-to-Metro Service (PMSV) Radio.

1.2.2.4. Disseminate Terminal and Area Weather Warnings, Watches, and Advisories with first priority to local units (i.e., 341 SW and 40 Helicopter Flight (40HF)) and second priority to external units, including the Army Aviation Support Facility (AASF) at Helena Regional Airport and the Montana Air National Guard (MANG), 120th Fighter Wing (FW), at Great Falls International Airport (IAP).

1.2.2.5. Disseminate Pilot Reports (PIREPs).

1.2.2.6. Prepare and Disseminate Forecasts.

1.2.2.7. Provide Flight Weather Briefings.

1.2.2.8. Provide Other Briefings.

1.2.2.9. Other Duties.

NOTE: The Automated Weather Distribution System (AWDS) is used to locally disseminate weather, forecasts, watches, warnings, advisories, and PIREPs to customers with AWDS terminals. Due to limited staffing and the time-critical nature of this information, the BWS cannot individually notify every agency requesting information. A detailed breakdown of weather products on AWDS is available through the BWS.

1.3. Operational Support Requirements:

1.3.1. Supported agencies will:

1.3.1.1. Establish and coordinate all weather support requirements and procedures with the BWS.

1.3.1.2. Notify the BWS of any changes in weather support requirements.

1.3.1.3. Coordinate with the BWS for required weather training.

1.3.2. Unit commanders will:

1.3.2.1. Ensure they are kept informed of critical weather elements affecting their operations. This is accomplished by dissemination of weather information through established communication procedures as outlined in **Chapter 5** and attachments in this instruction.

1.3.2.2. Ensure procedures are established within their organization to adequately respond to disseminated weather information.

1.3.2.3. Review this instruction at least annually for any changes in support requirements. Coordinate these changes with the BWS.

Chapter 2

WEATHER OBSERVING

2.1. General. The closest official weather observation to Malmstrom AFB is the automated (manually supplemented) observation at Great Falls International Airport (KGTF); however, because of the eight mile distance and 150 foot difference in elevation, is not necessarily representative of local conditions on MAFB. This observation is provided locally on AWDS.

2.2. Limitations: The BWS has no observers and takes no official observation. However, the on-duty forecaster can utilize the Automated Surface Observing System (ASOS), KGTF observation, and use his or her best estimate of the local conditions to approximate current conditions (wind speed/direction, temperature, dew point, (visibility and ceiling (estimate only)), and altimeter setting for one-time requests. Limit these requests to operational necessity.

2.3. Meteorological Equipment Locations and Limitations. Readouts for all meteorological sensors are located at Bldg 360. In addition the Base Weather ASOS provides current weather readouts for Helicopter Operations (Bldg 769) and Fire Station (Bldg 340).

2.3.1. ASOS is located 250 yards southwest of Bldg 360. This system continually senses and displays current weather conditions.

NOTE: ASOS at Malmstrom AFB is a stand alone system (not manually augmented), and it does not produce an official observation. ASOS can accurately measure wind speed/direction, temperature, dew point, altimeter, barometric pressure, cloud heights (up to 12,000 feet), current weather conditions (e.g., rain, snow, etc), and liquid precipitation amounts at a single point. However, it cannot accurately measure sector visibility or sky conditions throughout the horizon circle (e.g., CLR, FEW, BKN, OVC, or indefinite ceilings), and therefore, ASOS cannot produce an official observation for Malmstrom AFB.

2.3.1.1. Temperature and Dew Point are measured in Fahrenheit and Celsius. Backup for this sensor is a hand-held psychrometer used at ground level outside Bldg 360.

2.3.1.2. Wind Speed and Direction. Wind speed is measured in knots. Backup consists of a hand held anemometer used near ground level outside of Bldg 360.

2.3.1.3. Barometric Pressure and Altimeter Setting are measured in millibars and inches respectively. The ML-102, Aneroid Barometer, serves as a backup.

2.3.1.4. Visibility is measured in increments of 1/16th of a statue mile (SM), up to 10 SM. As a backup, forecasters can **approximate** visibility using local predetermined visibility markers.

2.3.1.5. Cloud Bases are detected up to 12,000 feet above ground level (AGL). As a backup, forecasters can only **roughly approximate** cloud bases.

2.3.1.6. Liquid Precipitation is measured in increments of 1/100th of an inch. Located west of Bldg 360, a stand alone rain gauge, acts as a back up.

2.3.1.7. Current Weather such as rain, rain showers, snow, fog, etc.

2.3.2. WSR-88D, Doppler Weather Radar, is located one mile south of Great Falls IAP. A Principal User Processor (PUP) Workstation is located in the BWS. Limitations include:

2.3.2.1. Range of 150 Nautical Miles (NM) for most radar products and an effective range of about 60 NM for detection of tornadic activity.

2.3.2.2. Mountain ranges from SE-SW-NW block radar returns, resulting in an inability to detect precipitation.

2.3.2.3. There is no operationally suitable backup for the WSR-88D radar. If the base weather station's PUP in not operational, a forecaster can be sent to Great Falls National Weather Service (NWS) to utilize their PUP. This would only be implemented during emergencies and as NWS schedule allows.

2.3.3. Lightning Detection System has no sensors on Malmstrom AFB, but can display lightning strikes anywhere in the CONUS. Limitations:

2.3.3.1. Not all strikes are detected by the system.

2.3.3.2. There is no operational backup for the Lightning Detection System.

Chapter 3

WEATHER FORECASTING

3.1. General. The BWS routinely issues forecasts for Malmstrom AFB.

3.2. Limitations. The BWS will provide forecast support as required by this instruction and other governing directives. Supported agencies must be aware of the limitations imposed by current meteorological equipment and our data-sparse region. Forecasting for elements or locations not contained in pertinent directives is neither implied nor should it be inferred.

3.3. Forecast. The BWS issues 24-hour forecasts for Malmstrom AFB, four times daily, at 0000Z, 0600Z, 1200Z, and 1800Z. (The forecast will be in the same format as a TAF-see AFMAN 15-124.) Forecasts are valid for the area within 5 SM from the center of the base. The term vicinity (VC) may be used and normally refers to the area between 5 and 10 SM from the center of the base. The forecaster will disseminate the forecast locally via AWDS.

3.3.1. Contents of the forecast will be in the following order (as presented on AWDS):

3.3.1.1. Heading - KGFA FCST.

3.3.1.2. Valid times for forecast (Zulu).

3.3.1.3. Text:

3.3.1.3.1. Wind direction in degrees magnetic and speed (including maximum gusts) in knots.

3.3.1.3.2. Prevailing visibility with weather and obstructions to vision (if any).

3.3.1.3.3. Cloud heights (AGL) and coverage (e.g., clear [SKC], few clouds [FEW], scattered sky condition [SCT], broken sky condition [BKN], overcast sky condition [OVC], and obscured sky condition [VV]).

3.3.1.3.4. Intensity, type, and levels (AGL) of aircraft icing. Note: Optional if forecast above 10,000 feet Mean Sea Level (MSL), mandatory if below.

3.3.1.3.5. Intensity and levels (AGL) of turbulence. Note: Optional if forecast above 10,000 feet MSL, mandatory if below.

3.3.1.3.6. Lowest altimeter setting.

3.3.1.3.7. Remarks.

3.3.1.3.8. Temporary groups are used to specify intermittent conditions and will appear as TEMPO bb-ee, where bb is the start hour and ee is the ending hour of the intermittent conditions. Temporary groups only specify those conditions expected to be different from the forecasted predominate conditions.

3.3.1.3.9. Becoming groups are used to specify a change in predominate conditions and will appear as BECMG bb-ee, where bb-ee specifies the one-hour period of change (i.e., 12-13 indicates the change will occur between 1200 and 1300 UTC). Becoming groups will contain all of the elements listed in paragraphs **3.3.1.3.1.** through **3.3.1.3.7.**

3.3.1.3.10. Example:

KGFA FCST 00-24 23015G25KT 7 SCT050 BKN120 OVC250 ALSTG30.12INS SHRA OMTNS SE-SW

TEMPO 01-03 25020G40KT 3 -TSRA BR BKN050CB MOD MXD ICG 050-100 LGT - MOD CAT SFC-100

BECMG 03-04 21009KT 7 FEW050 SCT120 BKN250 ALSTG30.20INS

Forecast for Malmstrom AFB, valid from 0000 to 2400 UTC. Starting at 0000 UTC; winds will be SW at 15 gusting to 25 knots with unrestricted visibility. There will be a scattered cloud deck at 5,000', broken at 12,000', and overcast at 25,000' AGL. The minimum altimeter setting will be 30.12" of mercury, and there'll be rain showers over the mountains to the SE through the SW. Intermittently between 0100 and 0300 UTC, winds will increase to WSW at 20 gusting to 40 knots with 3 miles visibility and thunderstorms with light rain and fog. There'll be a broken ceiling of cumulonimbus at 5,000' AGL, with moderate mixed icing from 5,000' to 10,000' AGL. Expect light, occasionally moderate clear air turbulence from the surface to 10,000' AGL. Between 0300 and 0400 UTC, conditions will become: winds SSW at 9 knots with unrestricted visibility and a few clouds at 5,000', scattered at 12,000', and broken at 25,000' AGL. The minimum altimeter setting will be 30.20" of mercury.

3.3.2. Specification Criteria: The forecast will specify the time of forecast occurrence to the nearest hour, the duration, and intensity, where applicable, when one or more of the following weather elements is expected to occur within the valid period of the forecast (AFMAN 15-124):

3.3.2.1. An increase in ceiling or visibility to a condition equal to or higher than, or a decrease to a condition lower than:

3.3.2.1.1. Ceiling: 3,000, 1,500, 1,000, 700 feet (AGL).

3.3.2.1.2. Visibility: 3, 2, 1, Statute Miles (SM).

3.3.2.2. A change in wind speed of 10 knots or more.

3.3.2.3. A change in wind direction of 30 degrees or more when the wind speed (predominant or gust) after the change is expected to be greater than 15 knots.

3.3.2.4. Any precipitation.

3.3.2.5. Thunderstorms.

3.3.2.6. Any Malmstrom AFB forecast weather advisory criteria (see **Chapter 4**).

3.3.2.7. Any Malmstrom AFB forecast weather warning criteria (see **Chapter 4**).

3.3.2.8. Icing and/or turbulence and/or low level wind shear (LLWS) not associated with thunderstorms.

3.3.2.9. Lowest altimeter expected in initial period and each forecast change group (excluding TEMPO groups).

3.3.2.10. Any other meteorological condition which adequately describes expected weather.

3.3.3. Amendments. Changes to the forecast are disseminated locally in the same format and contents as the original forecast. The amended forecast is valid from the time it's issued through the end of the original forecast period. Provided the conditions are expected to last 30 minutes or longer, an amended forecast will be issued when any of the following is not specified in the original forecast and

is observed (in the best estimate of local conditions by the duty forecaster) or is expected to occur at MAFB:

3.3.3.1. A ceiling and/or visibility out of category condition exists or is expected to occur:

3.3.3.1.1. Ceiling and/or visibility equal to or greater than 3,000 feet AGL and/or 3 SM.

3.3.3.1.2. Ceiling and/or visibility equal to or greater than 1,000 feet AGL and/or 2 SM, but less than 3,000 feet AGL and/or 3 SM.

3.3.3.1.3. Ceiling and/or visibility equal to or greater than 700 AGL feet and/or 1 SM, but less than 1,000 feet AGL and/or 2 SM.

3.3.3.1.4. Ceiling and/or visibility less than 700 AGL feet and/or 1 SM.

3.3.3.2. Surface winds are out of category or are expected to occur:

3.3.3.2.1. The forecast wind speed is in error by 10 knots or more.

3.3.3.2.2. The wind direction is in error by 30 degrees or more when the wind speed (predominant or gusts) are, or are expected to be, greater than 15 knots.

3.3.3.2.3. An unforecast wind occurrence results in a Malmstrom AFB weather warning being issued, extended, or canceled.

3.3.3.3. Precipitation when:

3.3.3.3.1. Unforecasted freezing precipitation begins or ends.

3.3.3.3.2. The beginning or ending of precipitation causing local weather warning or weather advisory to be issued, canceled, or amended.

3.3.3.3.3. The forecaster considers the occurrence or nonoccurrence of precipitation to be operationally significant.

3.3.3.4. Icing when the beginning or ending, not associated with thunderstorms, from surface to 10,000 feet MSL first meets, exceeds, or decreases below light or greater thresholds and was not specified in the forecast.

3.3.3.5. Turbulence when the beginning or ending, not associated with thunderstorms, from surface to 10,000 feet MSL first meets, exceeds, or decreases below moderate or greater thresholds (for CAT I aircraft) and was not specified in the forecast.

3.3.3.6. Low Level Wind Shear (LLWS) not associated with thunderstorms is defined as shear within 2000 feet of the surface, at or in the vicinity of the TAF airport, causing an indicated air speed loss or gain of 10 knots or more are received AND the forecaster determines that the reports reflect a valid low level wind shear rather than mechanical turbulence due to strong surface winds; or when vertical shears of 10 knots or more per 100 feet in a layer more than 200 feet thick are expected or reliably reported within 2,000 feet of the surface at or in the vicinity of the airport .

3.3.3.7. When other weather warning criteria:

3.3.3.7.1. Occur, or are expected to occur, during the forecast period, but were not specified in the forecast.

3.3.3.7.2. Are specified in the forecast, but are no longer occurring or expected to occur during the forecast period.

3.3.3.8. The forecaster does not consider the forecast to be representative of existing or expected conditions.

3.4. Convoy Movement. The BWS will provide forecast support to all CAT I movements.

3.4.1. The BWS will be included in the conference call briefings prior to any CAT I movement. The forecaster will tailor the weather briefing to the specific route when given prior notification of time and route of the CAT I movement. This prior notification must take place as far in advance as possible to the actual briefing time. When prior notification of the time and route is not provided, the forecaster will brief the worst expected weather within the entire complex. The CAT I movement briefing will contain the following information when possible:

3.4.1.1. Surface weather conditions.

3.4.1.1.1. Current weather along the route.

3.4.1.1.2. Current warnings and advisories valid for the route.

3.4.1.1.3. General forecast weather along the route, for the duration of the movement, to include sky coverage, visibility, and winds.

3.4.1.1.4. Temperature range along the route.

3.4.1.1.5. Sunrise and Sunset times (local).

3.4.1.2. Flight weather conditions.

3.4.1.2.1. Surface winds and winds at 1,000 feet AGL at Malmstrom AFB.

3.4.1.2.2. Freezing level (AGL) at Malmstrom AFB.

3.4.1.2.3. Forecast sky condition along the route (AGL).

3.4.1.2.4. In-flight weather and visibility or obstruction (if any) below 5,000 feet AGL along the route.

3.4.1.2.5. Icing below 10,000 feet MSL along the route.

3.4.1.2.6. Turbulence below 10,000 feet MSL along the route.

3.4.2. Amendments. Any significant changes in observed or forecast conditions expected to affect the CAT I movement will be passed to the Command Post. This includes, but is not limited to, issuance of a weather warning or weather advisory.

3.5. Major Missile Maintenance. The BWS will be notified prior to any scheduled major missile maintenance activity (via a daily fax) listing the locations of the next day's scheduled maintenance. The forecaster will notify 341 LSS/LGLOJ, Missile Maintenance Operations Center, of any thunderstorms within 20 NM of a maintenance site.

3.6. Flight Weather Packages:

3.6.1. Flight weather packages will be provided to aircrews IAW AFMAN 15-125.

3.6.2. The Helicopter Flight Weather Briefing package will be prepared for the 40 HF and faxed to their Helicopter Operations Center per coordinated days and times.

3.7. Weather Briefings. The BWS provides weather briefings to a number of customers on a scheduled and unscheduled basis. These briefings provide commanders and staff, operations, and aircrew personnel with valuable weather information for planning and decision making. Stand-up, missile crew pre-departure, aircrew, climatological, and seasonal briefings are provided routinely upon request.

3.7.1. Flight weather briefings will, whenever possible, be provided in person at the BWS. Briefings will be conducted IAW AFMAN 15-125.

3.7.1.1. Written weather briefings will be prepared using DD Form 175-1, **Flight Weather Briefing**.

3.7.1.2. Aircrews may receive verbal briefings upon their request. Verbal weather briefings will be recorded on AF Form 3125, **General Purpose** (Aircrew Briefing Log [341 OSS/OSW Overprint]).

3.8. Pilot-to-Metro Service (PMSV). The BWS operates a PMSV on the frequency of 239.8 MHz (UHF). It is the primary means of disseminating weather information to airborne aircraft. There is no alternate PMSV service available.

3.9. Alternate Forecast Support. Normally, if evacuation of the BWS becomes necessary, the duty forecaster will relocate to the Alternate Weather Operations Site, 341 OSS Orderly room, Room 253A at Bldg 500. Forecasting support from this location will be limited. Once in place, the forecaster will establish telephone contact with the Command Post and Air Force Weather Agency (AFWA).

3.10. Toxic Corridor Calculation:

3.10.1. Upon notification by the Command Post, or Disaster Control Group (DCG), of any incident which involves a toxic spill the BWS will calculate a toxic corridor and provide it to the Command Post and DCG on-scene commander, **when requested**.

NOTE: Toxic spill is defined as an industrial chemical spill. This does not include nerve agents, blister agents, blood agents, or radiation leaks. The BWS does not possess the equipment nor training to plot corridors involving these substances.

3.10.2. The first notification to the BWS does not normally contain all necessary information (type substance, release rate, amount) to compute a representative corridor length. Therefore, a “worst case” toxic corridor will be computed **based on wind speed, direction, and variability alone.**

3.10.3. An accurate corridor length and width (in feet) will be computed and relayed as soon as the necessary information is obtained. Necessary information is:

3.10.3.1. Chemical name and location of spill.

3.10.3.2. Amount and release rate.

NOTE: When wind speed is less than 4 knots the toxic corridors may be given as a circle around the spill. This will be given as a radius of the circle in feet.

3.10.4. Significant changes to the corridor will be relayed to Command Post and DCG on-scene commander as necessary.

3.10.5. Toxic Corridors are computed IAW the Air Force Chemical Dispersion Model (AFTOX).

3.10.6. In-person briefings will be provided upon request, if manning allows.

Chapter 4

WEATHER WARNINGS, WEATHER WATCHES, AND WEATHER ADVISORIES

4.1. General. Certain weather conditions endanger property or life, pose a safety hazard, or adversely affect a supported agency's operations. The BWS will monitor observations and forecasts for these conditions and advise support agencies when these conditions are observed or forecast. Weather warnings and advisories are the vehicles through which supported agencies are notified of these critical weather conditions.

NOTE: Only one warning, which may contain more than one warning criteria, will be in effect at any given time for any one location (i.e., Malmstrom AFB or the 341 SW Missile Complex).

4.2. Limitations. Reports received from all 341 SW field personnel are considered unofficial weather observations.

4.3. Weather Watches (Malmstrom AFB):

4.3.1. Weather watches are issued for a 5 SM radius from the center of Malmstrom AFB. Watches are issued when atmospheric conditions are forecast to become favorable for the development of severe weather. If severe weather conditions develop, or if severe weather is imminent, the watch will be upgraded to a warning. Watches do not have lead-time requirements and are normally issued well in advance of severe weather occurrences. Weather watch criteria follow:

4.3.1.1. Tornado Watch (Malmstrom AFB OPLAN 32-1, *Readiness Flight Operations Plan*).

4.3.1.2. Severe Thunderstorm Watch (surface wind $\geq$ 50 knots and or hail $\geq$ ¾ inch) (T.O. 1H-1(U)N-1).

4.3.1.3. Winter Storm Watch (Snowfall of $\geq$ 4 inches in 24 hours which may be associated with wind chills $\leq$ -25 F^{o}, and visibility $\leq$ 1SM).

4.3.1.4. High Wind Watch (non-convective wind gust $\geq$ 45 knots) (T.O. 1H-1(U)N-1).

4.3.1.5. Freezing Precipitation Watch (T.O. 1H-1(U)N-1 and AFSPCI 11-206).

4.3.1.6. Lightning Watch (lightning expected within 10 SM of MAFB within 30 minutes) (AFMAN 15-125).

4.3.2. Dissemination of weather watches will be IAW **Attachment 2**. Watches are issued via AWDS with an urgent alert and are accompanied by a hot-line call to the Command Post to ensure receipt. Watches are not assigned numbers as are warnings.

4.4. Weather Watches (341 SW Missile Complex):

4.4.1. Weather watches are issued for the most appropriate area of the missile complex. Watches are issued when atmospheric conditions are forecast to become favorable for the development of severe weather. If severe weather develops, or if severe weather is imminent, the watch will be upgraded to a warning. Watches do not have lead-time requirements and are normally issued well in advance of severe weather occurrences. Weather watch criteria is as follows:

4.4.1.1. Tornado Watch (Malmstrom AFB OPLAN 32-1, *Readiness Flight Operations Plan*).

4.4.1.2. Severe Thunderstorm Watch (surface wind ≥ 50 knots and/or hail ≥ ¾ inch) (T.O.s 21M-LGM30G-2-1-8, 21M-LGM30G-2-1-9, 21M-LGM30G-1-20, 21M-LGM30G-1-24, and 21M-LGM30F-1-23).

4.4.1.3. Winter Storm Watch (heavy snowfall of ≥ 4 inches in 24 hours which may be associated with wind chills ≤ -70 F^{o} and visibility ≤ ½ SM). (T.O.s 21M-LGM30G-2-1-8, 21M-LGM30G-2-1-9, 21M-LGM30G-1-20, 21M-LGM30G-1-24, and 21M-LGM30F-1-23).

4.4.1.4. High Wind Watch (non-convective wind gust ≥ 50 knots) (T.O.s 21M-LGM30G-2-1-8, 21M-LGM30G-2-1-9, 21M-LGM30G-1-20, 21M-LGM30G-1-24, and 21M-LGM30F-1-23).

4.4.1.5. Freezing Precipitation Watch (T.O.s 21M-LGM30G-2-1-8, 21M-LGM30G-2-1-9, 21M-LGM30G-1-20, 21M-LGM30G-1-24, and 21M-LGM30F-1-23).

4.4.1.6. Lightning Watch (lightning expected within 20 SM of CAT I convoy route or major missile maintenance activity within the next 30 minutes) (AFMAN 15-125).

4.4.2. Dissemination of weather watches will be IAW with **Attachment 3**. Watches are issued via AWDS with an urgent alert and are accompanied by a hot-line call to the Command Post to ensure receipt. Watches are not assigned numbers as are warnings.

4.5. Weather Warnings (Malmstrom AFB):

4.5.1. Weather warnings are issued for a 5 SM radius from the center of Malmstrom. These products are issued whenever the following weather elements are expected at Malmstrom AFB. Desired lead-times are listed after each criterion as follows:

4.5.1.1. Tornado: 5 minutes lead-time (Malmstrom AFB OPLAN 32-1, *Readiness Flight Operations Plan*).

4.5.1.2. Severe Thunderstorm (surface wind ≥ 50 knots and/or hail ≥ ¾ inch): 60 minutes lead-time (T.O. 1H-1(U)N-1).

4.5.1.3. Winter Storm (initial or additional snowfall of ≥ 4 inches in 24 hours): 6 hour lead-time before first (estimated) measurement of 4”.

4.5.1.4. Surface Wind ≥ 45 knots (not associated with thunderstorms): 30 minutes lead-time (T.O. 1H-1(U)N-1).

4.5.1.5. Freezing Precipitation: 30 minutes lead-time (T.O. 1H-1(U)N-1 and AFSPCI 11-206).

4.5.1.6. Lightning Observed (lightning observed within 10 SM of MAFB): no lead time. This warning is valid until lightning moves beyond 10 SM of MAFB (AFMAN 15-125).

4.5.2. Warnings are numbered consecutively (starting at one) for each month and prefixed with a "P".

4.5.3. A warning will not be issued if there is an unforecast occurrence that has stopped and is not expected to recur.

4.5.4. Dissemination of warnings will be IAW **Attachment 2**. Warnings are issued via AWDS with an urgent alert and accompanied by a hot-line call to the Command Post to ensure receipt.

4.6. Weather Warnings (341 SW Missile Complex):

4.6.1. Weather warnings are issued for the appropriate area of the missile complex. These products are issued whenever the following weather elements are expected. Desired lead-times are listed after each criterion as follows:

4.6.1.1. Tornado: 5 minutes lead-time (Malmstrom AFB OPLAN 32-1, *Readiness Flight Operations Plan*).

4.6.1.2. Severe Thunderstorm (surface wind ≥ 50 knots and/or hail ≥ ¾ inch): 60 minutes lead-time (T.O.s 21M-LGM30G-2-1-8, 21M-LGM30G-2-1-9, 21M-LGM30G-1-20, 21M-LGM30G-1-24, and 21M-LGM30F-1-23).

4.6.1.3. Winter Storm (initial or additional snowfall of ≥ 4 inches in 24 hours): 6 hour lead-time before first measurement of 4". (T.O.s 21M-LGM30G-2-1-8, 21M-LGM30G-2-1-9, 21M-LGM30G-1-20, 21M-LGM30G-1-24, and 21M-LGM30F-1-23).

4.6.1.4. Surface Wind ≥ 50 knots (not associated with thunderstorms): 30 minutes lead-time (T.O.s 21M-LGM30G-2-1-8, 21M-LGM30G-2-1-9, 21M-LGM30G-1-20, 21M-LGM30G-1-24, and 21M-LGM30F-1-23).

4.6.1.5. Freezing Precipitation: 30 minutes lead-time (T.O.s 21M-LGM30G-2-1-8, 21M-LGM30G-2-1-9, 21M-LGM30G-1-20, 21M-LGM30G-1-24, and T.O. 21M-LGM30F-1-23).

4.6.1.6. Lightning Observed (within 20 SM of major missile maintenance activity or a CAT I convoy route): no lead time. This warning is valid until lightning moves beyond 20 SM of above sites. (AFMAN 15-125)

4.6.2. Warnings are numbered consecutively (starting at one) for each month and prefixed with an "A".

4.6.3. A warning will not be issued if there is an unforecast occurrence that has stopped and is not expected to recur.

4.6.4. Dissemination of warnings will be IAW **Attachment 3**. Warnings are issued via AWDS with an urgent alert and accompanied by a hot-line call to the Command Post to ensure receipt.

4.7. Weather Advisories (Malmstrom AFB).

4.7.1. Weather advisories are issued for a 5 SM radius from the center of Malmstrom AFB. These products are issued whenever weather advisory criteria are expected at or near Malmstrom AFB. As defined below, some advisories are Forecast Weather Advisories (FWA) and may require lead-time notification, while others are Observed Weather Advisories (OWA), meaning they are issued when conditions are observed to exist. Advisory classification (i.e., FWA or OWA), desired lead-time (when applicable), and product dissemination method (on AWDS) follow:

4.7.1.1. Wind Chill ≤ -25F^{o} and ≤ -70 F^{o}: OWA, by AWDS.

4.7.1.2. Gust Spread ≥ 20 Knots: OWA, by phone to helicopter operations (T.O. 1H-1(U)N-1).

4.7.1.3. Heavy Rain (accumulation of rain ≥ 2 inches in 12 hours): FWA, 30 min lead-time, by AWDS (T.O.s 21M-LGM30G-2-1-8 and T.O. 21M-LGM30G-2-1-9).

4.7.1.4. Snow Advisory (accumulation of ≥ 1 inch, but < 4 inches in 24 hours): FWA, 60 min lead-time, by AWDS (T.O.s 21M-LGM30G-2-1-8 and 21M-LGM30G-2-1-9).

4.7.1.5. Freezing Fog (fog that accumulates as ice on exposed surfaces): OWA, by AWDS (AFSPCI 11-206).

4.7.2. Dissemination of advisories will be in accordance with **Attachment 5**. All advisories disseminated by AWDS are followed up with a hot-line call to the Command Post.

4.8. Weather Advisories (341 SW Missile Complex).

4.8.1. Weather advisories are issued for the most appropriate area of the missile complex, and are issued for the smallest practical portion of the missile complex when they apply to major missile maintenance and CAT I convoy operations. These products are issued whenever the following weather elements are expected in the missile complex. As defined below, some advisories are Forecast Weather Advisories (FWA) and may require lead-time notification, while others are Observed Weather Advisories (OWA), meaning they are issued when conditions are observed to exist. However, because of the limited number of observing sites in the missile complex, conditions requiring an OWA may develop in the missile complex but go unobserved. Also, the BWS cannot guarantee the accuracy or timeliness of missile field weather observations. Weather advisory criteria, corresponding desired lead-times (when applicable), and any mission-specific requirements follow:

4.8.1.1. Surface Visibility $\leq$ 1/2 SM: FWA, 1 hour lead-time, by AWDS (AFSPCI 11-206, T.O.s 21M-LGM30G-2-1-8, 21M-LGM30G-2-1-9, 21M-LGM30G-1-20, 21M-LGM30G-1-24, and 21M-LGM30F-1-23).

4.8.1.2. Sustained Surface Wind > 30 Knots: FWA (CAT I Only), 1 hour lead-time, by AWDS (T.O.s 21M-LGM30G-2-1-8, 21M-LGM30G-2-1-9, 21M-LGM30G-1-20, 21M-LGM30G-1-24, and 21M-LGM30F-1-23).

4.8.1.3. Heavy Rain (accumulation of rain $\geq$ 2 inches in 12 hours): FWA, 30 min lead-time, by AWDS (T.O.s 21M-LGM30G-2-1-8 and 21M-LGM30G-2-1-9).

4.8.1.4. Snow Advisory (accumulation of $\geq$ 1 inch but < 4 inches of snow in 24 hours): FWA, 60 min lead- time, by AWDS (T.O.s 21M-LGM30G-2-1-8 and 21M-LGM30G-2-1-9).

4.8.1.5. Freezing Fog (fog that accumulates as ice on exposed surfaces): OWA

4.8.1.6. Wind Chill $\leq$ -25^{o}F and $\leq$ -70^{o}F: OWA.

4.8.2. Dissemination of advisories will be in accordance with **Attachment 4**. Weather advisories for CAT I missions are only passed via hot-line call to the Command Post. Similarly, OWAs for thunderstorms are passed via phone to the Command Post and 341 LSS/LGLOJ, Missile Maintenance Operations Center. All other advisories (heavy rain, snow, wind chill, and freezing fog) are issued via AWDS with an urgent alert and accompanied by a hot-line call to Command Post to ensure receipt.

Chapter 5

DISSEMINATION OF WEATHER INFORMATION

5.1. General . The BWS will assist supported agencies in maintaining an efficient, effective means of disseminating weather support information. Procedures developed to this end must ensure weather personnel do not spend more time communicating than monitoring weather conditions. All units receiving weather support must be involved in a continuous program of evaluation and improvement of the weather dissemination system, including inter-unit dissemination. Weather dissemination procedures must ensure the information is received by those who need it. Individual commanders of units in need of weather information are responsible for having their units listed on Command Post weather warning and advisory notification lists, and in the correct order.

5.2. Automated Weather Distribution System (AWDS):

5.2.1. The primary means of disseminating weather information is via the AWDS. AWDS terminals are located at:

5.2.1.1. 341 SW/CP, Malmstrom Command Post (primary and alternate).

5.2.1.2. 40 HF, Helicopter Operations.

5.2.1.3. 741 SFS/SFTRM, Missile Security Control.

5.2.1.4. 120 FW, MANG Operations Desk

5.2.2. The AWDS is used to disseminate the following information:

5.2.2.1. Forecasts and amendments.

5.2.2.2. Base and Complex weather warnings, watches, and advisories.

5.2.2.3. Pilot reports (PIREPs).

5.2.3. The following applies to all AWDS transmissions:

5.2.3.1. All wind directions are in degrees magnetic.

5.2.3.2. All weather forecast heights are AGL. PIREP heights are MSL.

5.2.3.3. Wind speeds are in knots.

5.2.3.4. All times are in Universal Time Coordinate (UTC, also known as ZULU) unless the time is appended with an L in which case it is local time.

5.2.4. Those units possessing an AWDS terminal must monitor their system for operational status. Each agency experiencing an outage of their AWDS terminal will report it to BWS (ext 2710) so back-up telephone procedures may be initiated (if required) and maintenance actions taken.

5.2.5. The telephone will be used as a back-up for the AWDS. When the telephone is used, a read-back of disseminated weather information is recommended.

5.3. Information From the Alternate Weather Operations Site. In the event of a BWS evacuation, weather warnings, watches, advisories, and toxic corridors will be disseminated via telephone from the alternate weather operations site to the Command Post. The Command Post will notify those customers

identified in paragraphs **5.2.1.2.** to **5.2.1.4.** and relay information IAW **Attachment 2** through **Attachment 5**.

5.4. Weather Warning, Watch, and Advisory Notification. As prescribed in **Chapter 4**, the BWS will enter weather warnings and advisories into the AWDS, with some exceptions (e.g., CAT I advisories). Command Post will further disseminate warnings and advisories they receive in accordance with **Attachment 2** through **Attachment 5**.

Chapter 6

SPECIAL MISSION REQUIREMENTS

6.1. General. The previous chapters covered support requirements for the majority of the operations on Malmstrom AFB and the 341 SW Missile Complex. Information on units requiring unique support is outlined in this chapter. Any special support requirements not covered here should be coordinated with the BWS.

6.2. 341 SW Commander and Staff. The BWS will provide weather briefings at scheduled 341 SW Senior Staff meetings or upon request. The BWS will also respond to any recall as required by the 341 SW Commander.

6.2.1. Battle Staff Support. The BWS will provide 24-hour battle staff support, when tasked.

6.2.1.1. The BWS will provide weather representatives for 24-hour support to the secondary battle staff. During time of limited manning, one weather representative will not be able to provide 24-hour battle staff support. The BWS will produce all weather information requested from the primary and support battle staffs during periods of limited manning.

6.2.1.2. The weather representative will provide weather briefing to the primary and secondary battle staffs.

6.2.1.3. When requested, toxic corridor information will be presented.

6.2.1.4. The weather representative will maintain a copy of the latest Downwind Fallout Message (FUUS22 KGWC and FUUS45 KGWC).

6.3. 341st Operations Support Squadron (341 OSS). The BWS will provide an initial weather operations orientation to all new Facility Managers (FM). The BWS will define procedural instructions to the Missile Alert Facilities (MAF) for the purpose of missile site weather observations. The BWS will coordinate all new procedures or changes to existing procedures through 341 OSS in coordination with 341 OSS/OSO.

6.4. Safety. The BWS will provide meteorological data and/or personnel to assist in the investigation of ground, missile, or aircraft mishaps, as required.

6.5. Helicopter Operations (40 HF):

6.5.1. The BWS will provide faxed and verbal briefings of current and forecast conditions within the missile complex and at the base.

6.5.2. Upon request, BWS will provide any special operational, climatological, or flight safety briefings. Advance notice is required.

6.5.3. The BWS will monitor the TACAN system and notify job control of an outage. The BWS will transmit the appropriate NOTAM for an outage lasting more than one hour.

6.6. 341st Communications Squadron (341 CS):

6.6.1. The BWS will notify the Technical Support Center (341 CS/SCBBJ) of communications and support equipment outage, interruptions, and restores. The duty forecaster will open and close all applicable job control numbers regarding meteorological and communications support equipment with 341 CS.

6.6.2. The BWS will assist 341 CS/SCBBJ with any mission impact reports and coordinate scheduled maintenance to minimize the impact on weather operations.

6.7. 341st Civil Engineer Squadron, Readiness Flight (341 CES/CEX).

6.7.1. Readiness Flight is the primary agency for the calculating and monitoring of effective downwind fallout data. The BWS will assist Readiness Flight by having the Effective Downwind Fallout message (message heading designator FUUS22 KGWC and FUUS45 KGWC) available for pick up by the 341 CES/CEX staff. It is the responsibility of the office of Readiness Flight to pick up or arrange delivery of the required information. The BWS will hand carry the initial downwind vector information during recall or Battle Staff formation. Readiness Flight will request additional updates as needed.

6.7.2. When requested, the Readiness Flight is the primary agency for calculating nerve agent, blister agent, or blood agent corridors. BWS will assist the Readiness Flight by providing all meteorological data.

Chapter 7

RECIPROCAL SUPPORT

7.1. General. The BWS requires reciprocal support from various base agencies, particularly where the required support is beyond BWS capabilities. The support requirements outlined herein are essential to BWS providing timely, accurate weather support to Malmstrom AFB.

7.2. Command Post (341 SW/CP). The 341 SW/CP will:

7.2.1. Notify the BWS of any wing events or incidents that may involve or require weather support.

7.2.2. Disseminate weather warnings, watches, and advisories to supported agencies as outlined in **Attachment 2** through **Attachment 5**.

7.2.3. Relay information concerning toxic substance spills (e.g., location, chemical name, source strength in pounds (lbs) per minute, or total amount in lbs, etc.), as soon as available, to the duty forecaster.

7.2.4. Immediately notify the duty forecaster of reported damage to government property resulting from weather phenomena.

7.2.5. Provide time during training meetings for the BWS to present information and training on weather subjects in which Command Post personnel are involved.

7.3. Helicopter Operations (40 HF). The 40 HF will:

7.3.1. Provide PIREPS of any significant or unexpected weather encountered in flight, via PMSV, or debrief to BWS.

7.3.2. Coordinate and provide time during flying safety meetings for weather presentations on selected subjects.

7.4. 341st Communications Squadron (341 CS). The 341 CS will:

7.4.1. Maintain a priority listing for restoration of weather equipment. This list will be coordinated between the BWS and 341 CS and incorporated into 341 CS operating instructions (OIs). The BWS may alter the priority listing by coordinating with 341 CS if the meteorological situation warrants. Upon notification of a meteorological or communications outage of any type, the Technical Support Center (341 CS/SCBBJ) will take the appropriate maintenance action in accordance with the priority listing.

7.4.2. Provide access to the meteorological equipment sensors for the BWS.

7.4.3. Provide access to weather equipment operational technical orders for the BWS.

7.4.4. Coordinate all scheduled maintenance on meteorological equipment with the BWS. If weather conditions dictate caution, weather equipment will not be taken down for scheduled maintenance.

7.4.5. Coordinate all mission impacts for inoperable weather equipment with the BWS.

7.5. 341st Operations Support Squadron, Operations Training Flight (341 OSS/OSO). The 341 OSS/OSO will:

7.5.1. Train facility managers to accomplish surface weather observations (10 MS, 12 MS, 490 MS, and 564 MS) in accordance with 341 OSS/OSO operating instructions, to include the reporting of special weather criteria as determined by the BWS.

7.5.2. Coordinate revisions of operating instructions dealing with weather observations with the BWS.

7.5.3. Train facility managers to take surface weather observations and record them on a BWS approved Missile Complex Weather Observation Log.

7.5.4. Incorporate and train the requirement to fax (or in the event of a fax outage, telephone) missile observations by missile site personnel to the BWS not later than 0400L, 1000L, 1600L, and 2200L daily or upon request.

7.5.5. Coordinate training requirements for initial facility manager weather orientation training with the BWS.

7.5.6. Provide recurring weather observation training to facility managers. Coordinate lesson plan with the BWS.

7.6. 341st Space Wing, Public Affairs Office (341 SW/PA). The 341 SW/PA will:

7.6.1. Act as a liaison office between the BWS and all nonmilitary agencies or individuals.

7.6.2. Receive, process, and forward all valid requests for weather services (forecasts, climatology, lectures, visits, etc.) from nonmilitary sources to the BWS.

7.7. 341st Logistics Support Squadron, Maintenance Plans Section (341 LSS/ LGLOS). The 341 LSS/LGLOS will notify the BWS via fax about scheduling high profile vehicle movements and major maintenance in the missile complex. This will be done the day prior to the scheduled movements. Unscheduled, same day movements will be coordinated by 341 LSS/LGLOJ, Missile Maintenance Operations Center.

GLENN C. WALTMAN, Brig Gen, USAF
Commander, 341st Space Wing

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFPD 15-1, *Atmosphere and Space Environmental Support*

AFMAN 15-111, *Surface Aviation Observations METAR Code*

AFI 15-114, *Weather Support Evaluation*

AFI 15-118, *Requesting Specialized Weather Support*

AFMAN 15-124, *Meteorological Codes*

AFMAN 15-125, *Weather Station Operations*

AFI 31-101, Vol 1, *The Physical Security Program*

AFSPCI 11-206, *General Flight Rules*

DOD FLIP, *Department of Defense, Flight Information Publication*

T.O. 21M-LGM30G-2-1-8**,** *Missile Handling and Transportation (REACT A)*

T.O. 21M-LGM30G-2-1-9**,** *Missile Handling and Transportation (REACT B)*

T.O. 21M-LGM30G-1-20**,** *Communication and Ancillary Equipment (REACT B)*

T.O. 21M-LGM30G-1-24**,** *Communication and Ancillary Equipment (REACT A)*

T.O. 21M-LGM30F-1-23**,** *Communication and Ancillary Equipment (REACT)*

T.O. 1H-1(U)N-1, *Flight Manual-UH-1N Helicopter*

T.O. 00-25-172, *Ground Servicing of Aircraft and Static Grounding*

Malmstrom AFB OPLAN 32-1, *Readiness Flight Operations Plan*

Abbreviations and Acronyms

AFTOX—Air Force Toxic Chemical Dispersion Model

AFGWC—Air Force Global Weather Center (Offutt AFB NE)

AGL—Above Ground Level

ASOS—Automated Surface Observing System

AWDS—Automated Weather Distribution System

BKN—Broken Sky Condition (5/8 to 7/8 cloud coverage)

BWS—Base Weather Station

C—Degrees Celsius

F—Degrees Fahrenheit

FCST—Forecast

FEW—Few Clouds (1/8 cloud coverage)

FLIP—Flight Information Publication

FROPA—Frontal Passage

Hg—Atomic Symbol for Mercury

LLWS—Low Level Wind Shear

MAF—Missile Alert Facility

MHz—Megahertz (unit for the measurement of frequency)

MSL—Mean Sea Level (height above the average sea level)

NEXRAD—Next Generation Weather Radar (The NEXRAD is now termed the WSR-88D)

NM—Nautical Mile (Unit for measuring distance)

NOTAMS—Notice to Airman

NWS—National Weather Service (Department of Commerce)

OVC—Overcast Sky Condition (8/8 cloud coverage)

PIREP—Pilot Report

PMSV—Pilot-to-Metro Service

SCT—Scattered Sky Condition (2/8 to 4/8 cloud coverage)

SKC—Clear Sky Condition (0/8 cloud coverage)

TAF—Terminal Aerodrome Forecast

TEMPO—Temporary Conditions

UTC—Universal Time Coordinate

VC—Vicinity (between 5 and 10 SM from the center of MAFB)

>**—**Greater than (above)

<**—**Less than (below)

<**—**Less than or equal to

>**—**Greater than or equal to

Terms

Ceiling—the height of the lowest broken or overcast layer, when combined with coverage below it.

Celsius—a metric unit used to measure temperature.

Desired Lead-time—the amount of advance notice a supported agency needs to react to an advisory or warning (within the limits of state-of-the-art forecast capabilities).

Fahrenheit—an English Standard unit to measure temperature.

Forecast Weather Advisory (FWA)—a forecast of expected critical weather conditions accompanied by a valid period and a desired lead time.

Observed Weather Advisory (OWA)—an advisory issued when critical weather conditions are observed to occur. No valid times or desired lead times accompany this advisory.

Pilot-to-Metro Service (PMSV)—a two-way radio service used for exchange of weather information between the Base Weather Station (BWS) and aircraft.

Prevailing Visibility—the greatest distance that can be seen throughout at least half of the horizon circle (360 degree circle based at the horizon).

Severe Thunderstorm—a thunderstorm with 50 knot wind or greater and/or ¾ inch hail, or greater.

Weather Advisory—a special notice provided to a supported agency when an established weather condition that could affect its operation is occurring or is expected to occur.

Weather Warning—a special notice provided to a supported agency when an established weather condition of such intensity as to pose a hazard to property or life is occurring or is expected to occur. A weather warning is issued for situations that require the supported agency to take protective action.

Weather Watch—a special notice provided to customers to alert them that atmospheric conditions are favorable for the development of severe weather. A watch will be upgraded to a warning if severe weather activity appears imminent.

Zulu—a system of time, also known as Greenwich Mean Time or Universal Time Coordinate. This is the time measured on the prime meridian (0º longitude) in Greenwich, England.

Attachment 2

MALMSTROM AFB WEATHER WARNING, WATCH, AND ADVISORY NOTIFICATION SYSTEM

Duty Forecaster issues via AWDS *

then telephones the Command Post

who notifies:

341 OG/CC

341 SPTG/CC

341 SW/SE

341 SUPS/LGSF

341 LSS/LGLOJ

341 CS/SCBBJ

341 CES/CEF

341 SW/PA

Frosty Control (Winter storm warning and snow advisory only)

*Agencies notified by AWDS include those stated in para **5.2.1.**

Attachment 3

341 SW MISSILE COMPLEX WEATHER WARNING, WATCH, AND ADVISORY NOTIFICATION SYSTEM

Duty Forecaster issues via AWDS *

then telephones the Command Post

who notifies:

341 OG/CC

341 LSS/LGLOJ

341 CS/SCBBJ

341 CES/CEF

All Missile Squadron Command Posts

(Alpha, Golf, Kilo, Tango)

* Agencies notified by AWDS include those stated in para **5.2.1.**

Attachment 4

MALMSTROM AFB WEATHER ADVISORY FOR THUNDERSTORMS WITHIN/OUTSIDE 10 NM

Duty Forecaster issues via AWDS*

then telephones the Command Post

who notifies:

341 OG/CC

341 SPTG/CC

341 SUPS/LGSF

341 CS/SCBBJ

341 CES/CEF

341 LSS/LGLOJ

341 SW/SE

341 SW/PA

341 SPS/CSC

Swimming Pool

Youth Center (Apr-Aug)

Agencies notified by AWDS include those stated in para **5.2.1.**

Attachment 5

AWDS WEATHER WATCH, WARNING, AND ADVISORY EXAMPLES

A5.1. Weather Watch

Table A5.1. Tornado Watch

TORNADO WATCH **FOR MALMSTROM AFB** **Conditions are favorable for the development of tornadoes. A tornado warning will be issued when weather Observations or Doppler weather radar reflect AN imminent tornado**

Table A5.2. Severe Thunderstorm Watch

SEVERE THUNDERSTORM WATCH **FOR 490TH AND 10TH MISSILE SQUADRONS** **Conditions are favorable for the development of severe thunderstorms. Severe thunderstorms may produce heavy rain, frequent lightning, hail 3/4 inch or greater, and winds 50 knots or greater. A severe thunderstorm warning will be issued when weather observations or Doppler weather radar reflect AN imminent severe Thunderstorm.**

Table A5.3. Winter Storm Watch

WINTER STORM WEATHER WATCH **FOR 341 SW COMPLEX** **Conditions are favorable for the development of a winter storm. Winter storms produce heavy snow of 4 inches or more, and may be associated with wind chills -70f or less, and Visibility 1/2 of a statute mile or less. A winter storm warning Will be issued when Weather observations or Doppler weather Radar reflect imminent winter storm conditions.**

Table A5.4. High Wind Watch

HIGH WIND WATCH **FOR 341 SW COMPLEX** **Conditions are favorable for the development of winD GUSTS OF 50 KNOTS OR GREATER. a WARNING WILL BE ISSUED IF HIGH WIND CONDITIONS BECOME IMMiNENT.**

Table A5.5. Freezing Precipitation Watch

FREEZING PRECIPITATION WATCH **FOR MALMSTROM AFB** **Conditions are favorable for the development of FREEZING PRECIPITATION. A warning Will be issued when Weather observations or Doppler weather Radar reflect imminent FREEZING PRECIPITATION.**

Table A5.6. Lightning Watch

LIGHTNING WATCH **FOR MALMSTROM AFB** **A LINE OF THUNDERSTORMS IS APPROCHING MALMSTROM AFB AND IS EXPECTED TO PRODUCE LIGHTNING WITHIN 10 NM OF MALMSTROM IN THE** NEXT 30 MINUTES.

A5.2. Weather Warning

Table A5.7. Tornado

TORNADO WARNING (WW # P-02) **FOR MALMSTROM AFB** **At 0014Z, Doppler weather radar INDICATED a tornado-producing severe thunderstorm 12 NM Northwest of CasCADE, moving 060 at 36 knots.**

Table A5.8. Severe Thunderstorm

SEVERE THUNDERSTORM WARNING (WW # A-05) **FOR 564TH MISSILE SQUADRON** **At 2100Z, Weather observation reports verified a severe**

thunderstorm 15 NM WEST of CONRAD, moving WEST at 30 knots.
This thunderstorm is capable of producing frequent
lightNing, surface wind gusts to 55 knots, and ¾ inch hail.

Table A5.9. Winter Storm Warning

WINTER STORM WARNING (WW # A-02)
FOR 341 SW COMPLEX

WINTER STORM conditions with heavy snow accumulation of 7 inches.

Table A5.10. High Winds

WIND WEATHER WARNING (WW # P-03)
FOR MALMSTROM AFB

Surface wind gusts to 45 knots

Table A5.11. Freezing Precipitation

FREEZING PRECIPITATION WEATHER WARNING (WW # A-01)
FOR 490TH MISSILE SQUADRON.

AT 0925L DOPPLER RADAR INDICATED A BAND OF Freezing RAIN MOVING
EASTWARD INTO THE 490TH ms.

Table A5.12. Lightning Warning

LIGHTNING WARNING (WW # A - 09)
FOR ALPHA FLIGHT

LIGHTNING WITHIN 20 NM.

A5.3. Forecast Weather Advisory

Table A5.13. Heavy Rain

HEAVY RAIN ADVISORY **FOR MALMSTROM AFB** **RAIN Accumulation of 2 inches or greater in 12 hours.**

Table A5.14. Snow

SNOW ADVISORY FOR **341 SW COMPLEX** **SNOW ACCUMULATION GREATER THAN 1 inches BUT LESS THAN 4 INCHES** **IN 24 HOURS.**

Table A5.15. Surface Visibility

SURFACE VISIBILITY ADVISORY **FOR 10TH MISSILE SQUADRON** **SURFACE VISIBILITIES OF ½ SM OR LESS.**

A5.4. Observed Weather Advisory

Table A5.16. Wind Chill

WIND CHILL ADVISORY FOR **MALMSTROM AFB** **WIND CHILL -25 F OR LESS.**

Table A5.17. Freezing Fog

FREEZING FOG ADVISORY FOR **12TH AND 564TH MISSILE SQUADRONS** **FREEZING FOG CONDITIONS EXIST. FREEZING FOG CAN SIGNIFICANTLY** **COAT EXPOSED SURFACES WITH ICE, INCLUDING ROAD SURFACES.**